*Activity:*              **7.4**
                         **Write Programs**

*Responsibility:*        Project Team Programmers

*Description:*           This activity involves generating the source and object code for the software
                         product.  The code should be written in accordance with the programming
                         standards developed in the System Design Stage.  Regardless of the platform,
                         development of the code should adhere to a consistent set of programming
                         techniques and error prevention procedures.  This will promote reliable,
                         maintainable code, developed in the most efficient and cost effective manner.

                         The source and object code should be uniquely identified and stored in a way
                         to facilitate the configuration control measures described in the Software
                         Configuration Management Plan.

                         Writing programs includes the following tasks.

                         •       Use the Program Specifications developed in the System Design Stage
                                 as the basis for the coding effort.

                         •       Generate source code and machine-readable modules.

                         •       Generate the physical files and data base structure.

                         •       Generate video screens, report generation codes, and plotting
                                 instructions.

                         •       If conversion of an existing system or data is necessary, generate the
                                 program(s) described in the Conversion Plan.

                         •       Conduct preliminary testing of completed units.  When the test output is
                                 correct, review the program specification to assure that the unit or
                                 module conforms to the specification.

*Coding Practices:*      The following coding practices should be implemented.

                         •       The programming staff should meet at scheduled intervals to discuss
                                 problems encountered and to facilitate program integration and
                                 uniformity.

                         •       Program uniformity should be achieved by using a standardized set of
                                 naming conventions for programs, data elements, variables, and files.

*Coding Practices,*
*continued:*          •     Modules that can be shared by programs requiring the same
                           functionality should be implemented to facilitate development and
                           maintenance.

                     •     Meaningful internal documentation should be included in each program.
                     •     All code should be backed up on a daily basis and stored in an offsite
                           location to avoid catastrophic loss.

                     •     A standard format for storing and reporting elements representing
                           numeric data, dates, times, and information shared by programs should
                           be determined.

                     •     The System Design Document should be updated to reflect any required
                           deviations from the documented design.

*Work Products:*     The following work products are produced.

                     •     Completed units and modules of code.

                     •     Test materials generated from preliminary testing.

*Review Process:*    Weekly informal reviews of each programmer's work are recommended to keep
                     the project team informed of progress and to facilitate the resolution of any
                     problems that may occur.  The combined knowledge and skills of the team
                     members will help to build quality into the software product and support the
                     early detection of errors in design, logic, or code.

                     Conduct structured walkthroughs on completed units and modules to assure
                     that the code is accurate, logical, internally well documented, complete, and
                     error free.  Structured walkthroughs should also be used to validate that the
                     code is reliable and satisfies the program specifications and project
                     requirements.

                     For large or complex projects, conduct code inspections at successive stages of
                     code production.  These inspections are particularly important when code is
                     being produced by several programmers or different programming teams.  The
                     inspection team may include experts outside of the project.  Ideal times for
                     code inspections occur when code and unit tests are complete, and when the
                     first integration tests are complete.  Code inspections should be identified as
                     milestones in the Project Plan.